CLAIMS

1. A method for manufacturing a catalyst, wherein a substrate (1; 101) is introduced into a processing chamber (2; 102); wherein at least one plasma (P) is generated by at least one plasma cascade source (3; 103); wherein at least one deposition material (A, B) is deposited on the substrate (1; 101) under the influence of the plasma (P).

2. A method according to claim 1, wherein said deposition material (A,B) is supplied outside the at least one plasma source (3; 103) into the processing chamber (2; 102), preferably to the plasma (P) in the processing chamber.

3. A method according to claim 1 or 2, wherein at least one volatile compound of said deposition material (A, B) is supplied to the plasma (P) for the purpose of the deposition.

4. A method according to claim 3, wherein the volatile compound contains at least one precursor material which decomposes in the processing chamber (2; 102) in material to be deposited, before the material has reached the substrate (1; 101).

5. A method according to any one of the preceding claims, wherein at least a second deposition material (B) is deposited on the substrate (101) by at least a second plasma cascade source, a plasma source, a vapor deposition source and/or a sputtering source (121).

6. A method according to any one of the preceding claims, wherein at least one sputtering electrode (6) which comprises said deposition material (A, B) is arranged in the processing chamber (2), and the plasma (P) is contacted with each sputtering electrode (6) to sputter the substrate (1) with the material (A, B) of the electrode (6).

7. A method according to claim 6, wherein the plasma (P) is passed at least partly through at least one passage of the at least one sputtering electrode (6) to contact the plasma with the electrode (6).

8. A method according to any one of the preceding claims, wherein said deposition material comprises at least one catalyst material (A) which, whether or not after an activation treatment such as a reducing step, is catalytically active.

9. A method according to any one of the preceding claims, wherein said deposition material comprises at least one carrier material (B), which material is inherently, or after a further treatment, suitable to carry catalyst material.

10. A method according to claims 8 and 9, wherein the at least one catalyst material (A) and the at least one carrier material (B) are deposited on the substrate (101) by different sources (103, 103', 121, 121').

11. A method according to at least claims 6, 8 and 9, wherein the at least one sputtering electrode (6) contains at least a part of both said catalyst material (A) and said carrier material (B).

12. A method according to claim 11, wherein the sputtering electrode (6) contains compressed powders of said materials (A, B) to be deposited on the substrate (1).

13. A method according to at least claim 11, wherein the at least one sputtering electrode (6) contains an alloy of said catalyst material (A) and said carrier material (B).

14. A method according to any one of the preceding claims, wherein the substrate (101) comprises sheet material.

15. A method according to any one of the preceding claims, wherein the substrate (101) is moved in the processing chamber (102) at least in such a way that each time a different part of the substrate (101) makes contact with the plasma (P).

16. A method according to any one of the preceding claims, wherein the substrate (101) is brought from an environment into the processing chamber (102) and is discharged from the processing chamber (102) to the

environment while the deposition material is deposited on the substrate (101) in the processing chamber (102).

17. A method according to at least claim 1, wherein the substrate (1; 101) is substantially non-porous.

18. A method according to any one of the preceding claims, wherein the substrate (1; 101) comprises at least one carrier material (B).

19. A method according to any one of the preceding claims, wherein the substrate (1; 101) comprises at least one metal and/or alloy.

20. A method according to any one of the preceding claims, wherein the substrate (1; 101) comprises Fecralloy.

21. A method according to any one of the preceding claims, wherein the substrate (1; 101) comprises corrugated material.

22. A method according to at least claim 1, wherein the substrate (1; 101) is substantially porous.

23. A method according to at least claim 9, wherein said carrier material (B) comprises a metal.

24. A method according to at least claim 9, wherein said carrier material (B) comprises an oxidized metal.

25. A method according to at least claim 9, wherein said carrier material (B) comprises a semiconductor.

26. A method according to at least claim 9, wherein said carrier material (B) comprises an oxidized semiconductor.

27. A method according to claim 24 and/or 26, wherein the carrier material (B) further contains a heat-conducting material, such as carbon.

28. A method according to at least claim 8, wherein the at least one catalyst material (A) comprises nickel, copper, palladium, rhodium, platinum and/or iron.

29. A method according to at least claims 8 and 9, wherein the deposition material (A, B) is deposited such that the chemical composition of the deposited material measured over distances of 5 cm, preferably over a

distance of 10 cm, more particularly over a distance of 20 cm, differs by less than 10%, in particular less than 5% and more particularly less than 1%.

30. A method according to any one of the preceding claims, wherein a reducing step is carried out at an elevated temperature for the purpose of reduction of material (A) deposited on the substrate (1; 101).

31. A method according to claim 30, wherein the reducing step is carried out under the influence of hydrogen.

32. A method according to claim 31, wherein an inert gas, such as nitrogen or argon, which contains hydrogen, is supplied to the substrate (1; 101) for the purpose of the reduction.

33. A method according to any one of the preceding claims, wherein the substrate (1; 101) is adjusted to a particular electrical potential, for instance by DC, pulsed DC and/or RF biasing.

34. A method according to any one of the preceding claims, wherein the substrate (1; 101) is adjusted to a particular treatment temperature.

35. An apparatus for manufacturing a catalyst, wherein the apparatus is provided with at least one plasma cascade source (3; 103) to generate at least one plasma (P), the apparatus comprising means (6, 7) for bringing deposition material (A, B) into each plasma (P), the apparatus being further provided with substrate positioning means (8; 118) to bring and/or keep at least a part of a substrate (1; 101) in such a position in a processing chamber (2; 102) that the substrate (1; 101) makes contact with said plasma (P).

36. An apparatus according to claim 35, wherein the apparatus is provided with at least one sputtering electrode (6) which contains deposition material (A, B) to be deposited, wherein the sputtering electrode is positioned such that the plasma (P) generated by the at least one plasma source (3) during use sputters material (A, B) from the sputtering electrode (6) on the substrate (1).

37. An apparatus according to claim 36, wherein each sputtering electrode (6) is arranged downstream of the at least one plasma source (3), while at least one sputtering electrode (6) is provided with at least one plasma passage to allow the plasma (P) to pass from the source (3) to the substrate (1).

38. An apparatus according to claim 36 or 37, wherein the sputtering electrode (6) lies against the source (3).

39. An apparatus according to any one of claims 35-38, wherein the apparatus is provided with at least one fluid supply channel (7; 120) to supply a material to be deposited, being in a volatile state, to the plasma (P).

40. An apparatus according to at least claims 36 and 39, wherein the at least one sputtering electrode (6) is provided with said fluid supply channel.

41. An apparatus according to at least claim 35, wherein the apparatus is provided with at least two plasma cascade sources (103, 103') to generate at least two plasmas (P, P'), wherein these plasma cascade sources (103, 103') and the substrate positioning means (118, 118') are positioned such that opposite sides of the substrate (1; 101) during use make contact with the plasmas (P, P') generated by those cascade sources (103, 103') to deposit material on the opposite sides of the substrate (101).

42. An apparatus according to at least claim 35, wherein the apparatus is provided with a substrate supply roller (110) and discharge roller (111), respectively, for supply and discharge, respectively, of a substrate (101) that can be rolled up, such as a web and/or sheet-like substrate, to and from the processing chamber (102), respectively.

43. An apparatus according to at least claim 35, wherein a wall (104) of the processing chamber (102) is provided with at least one passage (105) to pass the substrate (101) into and/or out of that chamber (102).

44. An apparatus according to claim 43, wherein at least a part of the at least one passage (105) of the processing chamber wall (104) is bounded by oppositely arranged feed-through rollers (106), which feed-through rollers (106) are arranged to engage a part of the substrate (101) disposed between them during use, for the purpose of feed-through of the substrate (101).

45. An apparatus according to at least claim 42, wherein the apparatus is provided with deformation means (112) to deform the substrate (101) which has unrolled from the supply roller (110).

46. An apparatus according to claim 45, wherein the deformation means (112) are arranged to corrugate and/or serrate the substrate (101).

47. An apparatus according to at least claim 35, wherein the apparatus is provided with means for vapor-depositing material on the substrate (1; 101).

48. An apparatus according to at least claim 35, wherein the apparatus is provided with at least one separate sputtering source (121) for sputtering material on the substrate (101).

49. A catalyst provided with at least one carrier material (B) and at least one catalyst material (A), the carrier material comprising an oxidic material, and the carrier material further comprising at least one heat conducting material.

50. A catalyst according to claim 49, wherein the heat-conducting material comprises carbon.